

WHAT IS CLAIMED IS:

- 5 1. An electrodeionization apparatus, comprising:
a plurality of anion exchange membranes and a plurality of cation exchange
membrane that are alternately arranged between a cathode and an anode to alternately
form at least one concentrating compartment and at least one desalting compartment,
wherein
10 the concentrating compartments and the desalting compartments are filled with
ion exchangers, and a filling ratio of anion exchanger to cation exchanger of the ion
exchanger in the concentrating compartments is higher than a filling ratio of anion
exchanger to cation exchanger of the ion exchanger in the desalting compartments.
- 15 2. The electrodeionization apparatus according to claim 1, which comprises a
plurality of concentrating compartments and a plurality of desalting compartments,
wherein the filling ratio of anion exchanger to cation exchanger of the ion exchanger in
the concentrating compartments ranges from 75/25 to 95/5.
- 20 3. The electrodeionization apparatus according to claim 1 or 2, wherein the ion
exchanger in the concentrating compartment comprises a mixed ion exchange resin
comprising an anion exchange resin and a cation exchange resin, wherein a crosslinking
degree of the anion exchange resin is 3-8%, and a crosslinking degree of the cation
exchange resin is 5-10% .
- 25 4. The electrodeionization apparatus according to any one of claims 1-3,
wherein a ratio of a water introduction rate (L/h) into the desalting compartment to an
effective area (dm²) of the anion exchange membrane in the desalting compartment is 5
or higher.
5. The electrodeionization apparatus according to any one of claims 1-4, which

5 satisfies at least one of the following two conditions (1) and (2):

(1) a ratio of a carbonate loading ($\text{mg-CO}_2/\text{h}$) into the desalting compartment to an effective area (dm^2) of the anion exchange membrane in the desalting compartment being 80 or higher; and

10 (2) a ratio of a silica loading ($\text{mg-SiO}_2/\text{h}$) into the desalting compartment to an effective area (dm^2) of the anion exchange membrane in the desalting compartment being 8 or higher.

6. The electrodeionization apparatus according to any one of claims 1-5, wherein a current density of $300\text{mA}/\text{dm}^2$ or higher is applied.

7. The electrodeionization apparatus according to any one of claims 1-6, wherein the concentrating compartment is filled with an anion exchange resin that comprises a thermostable anion exchange resin.